

REMARKS

Claims 1 and 4 are presently pending in the application.

Claim 1 has been amended to more specifically recite a preferred embodiment of the present invention in which the vitreous carbon powder has a mean particle diameter of approximately 5 to 50 μm . This amendment is supported, for example in Embodied Examples 4 and 7 at pages 18 and 20 of the application, where specific examples of approximate mean particle diameters of 20 μm (Example 4) and 5, 10, 25 and 50 μm (Example 7) are disclosed. Accordingly, no new matter has been added, and entry of this Amendment is respectfully requested.

In the Advisory Action dated August 23, 2004, the Examiner ruled that the double patenting rejection in the Office Action of May 14, 2004 had been overcome by the filing of a Terminal Disclaimer. However, the Examiner held that the rejections of claims 1 and 4 over the prior art of record have not been overcome. In particular, the Examiner continues to reject claims 1 and 4 under 35 U.S.C. § 103(a) as being unpatentable over Tozawa in view of the Saito application and the Saito patent (claim 1) and further in view of JP 620 (claim 4). These rejections have already been discussed in detail in the Remarks section of the Amendment filed July 30, 2004 and will not be repeated here. However, Applicant's Remarks are incorporated herein by reference, and the Examiner's response to Applicant's arguments are discussed in detail below.

First, the Examiner takes the position that vitreous carbon (specified in the claims) covers a very large number of applicable materials and therefore contends that any composite layer comprising any vitreous/glassy carbon powder would exhibit the specific surface area claimed, namely less than 100 m^2/g . The Examiner further notes that this specific surface area does not include a lower limit, so that the recited specific surface area could read on 0, such that either no material is positively present, or there is no limitation to the claim language.

It is submitted that these arguments of the Examiner are unwarranted and a distortion of the claim language. First, the claim specifically requires the presence of an electroconductive particulate substance comprising vitreous carbon powder. The presence of such powder therefore requires that the particular substance have a specific surface area which cannot be 0.

Second, the Examiner has stated no basis for contending that any composite layer comprising a vitreous carbon powder would exhibit the claimed specific surface area. Third, it is the powder, not the composite layer, which exhibits the specific surface area, and in order to support an inherency rejection, the Examiner must show or state a reasonable basis for believing that the prior art necessarily has the same characteristics as claimed.

In any event, in order to more definitely claim this embodiment of the present invention, the claims now state that the vitreous carbon powder has a mean particle diameter of approximately 5 to 50 μm . Therefore, the range of applicable materials which can be used has been considerably reduced, and the Examiner cannot now contend that the claimed range of specific surface area reads on 0 m^2/g . The features of vitreous carbon presently claimed are not necessary or inherent to all types of vitreous carbon. In other words, the prior art does not necessarily or inherently have the features or properties of the vitreous carbon powder used in the presently claimed invention.

Typically, vitreous or glassy carbon has a specific gravity of about 2 g/cm^3 . Using a range of mean particle diameter of the vitreous carbon of approximately 5 to 50 μm , as presently claimed, the specific surface area of the claimed vitreous carbon will actually have a specific surface area in a range of about 0.06 to 0.6 m^2/g (theoretical calculated value). The table below shows the correlation between the particle size and the specific surface area obtained by assuming that the particles of the carbon powder are perfect spheres and have a specific gravity of 2 g/cm^3 . Thus, these values are not actually measured values, but are those calculated theoretically.

Mean particle size (μm)	5	10	20	25	50
Specific surface area (m^2/g)	0.6	0.3	0.15	0.12	0.06

Hence, based upon a mean particle diameter of the vitreous carbon in the claimed range of approximately 5 to 50 μm , the lower limit of the specific surface area of the claimed vitreous carbon, namely at a mean particle diameter of approximately 50 μm , will be about 0.06 m^2/g . As noted above, this specific surface area is clearly greater than 0.

The Examiner further asserts in the Advisory Action that the specific claimed surface area is inherent to the very same nature of the vitreous/glassy carbon of the prior art references, because products of identical chemical composition cannot have mutually exclusive properties. However, contrary to the Examiner's contention, even when chemical compositions are identical, the physical properties can be mutually exclusive. The range of the particle size of the claimed vitreous carbon is a physical property of the powder. However, there are commercially available various vitreous carbon powders having different particle sizes, and it cannot be reasonably assumed that they are all the same.

Saito et al. '279 (the Sato patent) does not teach or suggest the use of vitreous carbon powder having a mean particle diameter of approximately 5 to 50 μm , but instead indicates that the specific surface area can be increased as large as possible. However, even vitreous carbon having a mean particle diameter of 5 μm would have a specific surface area of about 0.6 m^2/g according to the theoretically calculated values (see table above). Given the assumptions for this theoretical calculation, the specific surface area of the powder particles having a mean diameter of about 5 to 50 μm cannot have a specific surface area larger than 0.6 m^2/g . Therefore, Saito et al. do not suggest the use of vitreous carbon powder having a mean particle diameter of not less than 5 μm , since the specific surface area of such particles will be smaller (see inverse relationship in table above), whereas Saito et al. suggest having a surface area as large as possible.

Finally, the Examiner rejects Applicant's arguments that the references fail to show certain features of Applicant's invention, because the features relied upon are not recited in the claims. In particular, the Examiner refers to Applicant's argument that the particular composition of the electroconductive resin layer of the separators in the fuel cells of the present invention were developed to solve the problem of corrosion of the metal substrate of the separator and the resultant damage to the membrane electrode assembly (MEA) due to metal ions leaching from the metal substrate of the separator in the MEA.

It appears that the Examiner has misunderstood or misconstrued Applicant's arguments in this regard. Thus, the arguments were intended to show that the present application addresses a problem which the prior art does not. That is, the prior art does not suggest the motivation necessary to accomplish the invention of the present application. It is not necessary to recite the

Application No. 10/069,900
Reply to Office Action of May 14, 2004

problems or deficiencies of the prior art in the claims, but such arguments support the difficulty or unobviousness in developing the claimed composition. Absent a recognition of such a problem in the prior art references, the Examiner cannot reasonably claim that there was motivation to combine the prior art, and without a more substantiated showing of inherency, the Examiner cannot contend that the prior art necessarily, though perhaps inadvertently, achieved the results of the presently claimed invention.

Accordingly, in view of the above, it is submitted that the Examiner has failed to show inherency of the presently claimed invention in the prior art and has failed to show motivation to combine the prior art to teach the presently claimed invention. Moreover, even if the prior art were properly combinable due to some extraneous motivation, the combination still fails to teach or suggest the presently claimed invention.

In view of the above, reconsideration and withdrawal of the rejections and an early Notice of Allowance are respectfully solicited.

Respectfully submitted,

HISAAKI GYOTEN ET AL.

November 15, 2004

(Date)

By:

William W. Schwarze

WILLIAM W. SCHWARZE

Registration No. 25,918

AKIN GUMP STRAUSS HAUER & FELD LLP

One Commerce Square

2005 Market Street, Suite 2200

Philadelphia, PA 19103-7013

Telephone: 215-965-1200

Direct Dial: 215-965-1270

Facsimile: 215-965-1210

E-Mail: wschwarze@akingump.com

WWS/rc

Enclosures: Request for Continued Examination (RCE) and Petition for Extension of Time
(3 months)